RECEIVED
OCT 2
VET. MED. LIBRARY

THE JOURNAL OF THE BRITISH VETERINARY ASSOCIATION

The Veterinary Record

PATRON: HER MAJESTY THE QUEEN

OHIO STATE UNIVERSITY
OCT 15 1958
LIBRARY

Vol. 70 No. 39 Issue No. 4199 779-798

September 27th, 1958

PROTHIDIUM

for the prophylaxis of bovine trypanosomiasis

Prothidium is given at a dosage level of 2 mg./kg. body weight and may be administered either subcutaneously or intramuscularly. At this rate, no acute or delayed systemic toxicity has been reported. Local reactions resemble those following the administration of other phenanthridine compounds.

As Prothidium is soluble in water its use as a solution gives it definite advantages over suspensions. It provides for more uniform absorption, it is quicker and more reliable in action and is easier to administer.

Prothidium is available as 0.5G tablets in bottles of 20 and 100.

FURTHER INFORMATION GLADLY SUPPLIED ON REQUEST

Boots **PROTHIDIUM**

-another product of Boots research

BOOTS PURE DRUG COMPANY LIMITED
International Division · NOTTINGHAM · ENGLAND

"THE INCISOR"

the magazine of

The Royal Veterinary College

●

1958 Edition now available

●

Copies, two shillings each, from E. K. Price, The Royal Veterinary College

VETERINARY MEDICINE

(*Established in 1905*)

A monthly magazine devoted to the promotion of the Art and Science of Veterinary Medicine

ROBERT L. ANDERES, B.S., D.V.M.
Editor

Price $5.00 per annum
(*See your newsagent or bookseller*)

Veterinary Magazine Corporation
Suite 803
LIVESTOCK EXCHANGE BUILDING
KANSAS CITY 15, MISSOURI, U.S.A

The
VETERINARY RECORD

Founded by William Hunting, F.R.C.V.S., in 1888

7, MANSFIELD STREET, PORTLAND PLACE, LONDON, W.1. MUSEUM 6541

No. 39 SEPTEMBER 27th, 1958 Vol. 70

Registered for Transmission as a Newspaper *Price 2s. post free*

The President's Address to the Association

MR. J. M. Ingram, who was received with loud applause, delivered the traditional Presidential Address to Delegates at the seventy-sixth Annual Congress on September 22nd. He said:—

"As is customary in the British Veterinary Association the President's year ends with one of the greatest of his travails. I refer, of course, to this formal address delivered to the Association at the Annual Congress. I feel sure, however, that every President must feel as I do at this time; that although the office one has the honour to hold has its great responsibilities and anxieties, it is something one would not willingly have missed. Perhaps the most happy aspect of all is the very great kindness one has experienced at the hands of one's fellow Officers, of the standing committees and of the Council. Nor can I forget the help of my colleagues, who have so admirably carried the burden of the practice during my frequent absences on official business, Mr. Knight, the General Secretary of the B.V.A., our Editor, and the other members of the permanent staff. I do want to thank most sincerely everyone who has done so much for me during this presidential year, and not least my own wife, but for whom the burden would have been increased a hundredfold. Veterinary wives, as I think you would agree, have a hard time, and I really believe the President's wife has the hardest time of all.

"When one is in the middle of things one appreciates, more than ever before, the remarkable growth of our Association and the ever-widening scope of its work. One realises, too, what a truly democratic body we are, and that is a cause for great satisfaction. The members of our Council, the chairmen of standing committees, the Officers, in fact everyone who helps to run the B.V.A., is an elected person. There are no nominees, and neither is anyone imposed so to speak upon us from outside. I feel sure that one of the main reasons for the health and constant growth of the B.V.A. is that democracy by which we are governed.

"In addressing you to-day I should like to divide my remarks into two parts—firstly those of a domestic nature and secondly those of wider public interest.

"On the domestic side the annual report, published in the Congress Handbook, gives a useful bird's-eye view of what has been accomplished during the year. I have not the time, nor is it necessary for me, to dwell upon every matter discussed; but among others you will notice the growth in our numbers, the long overdue Inland Revenue adjustment by which subscriptions to the B.V.A. would appear to be allowable for tax purposes as professional business expenses, and the wide variety of topics which have been dealt with by your Technical Development Committee. Among the latter, it is a source of satisfaction to note that after long negotiation with the Kennel Club a new ruling is to come into force on January 1st, 1959. After that date only entire dogs will be admitted to the show ring. Our Technical Development Committee established the fact that the conditions of monorchidism and cryptorchidism seemed to be hereditary, and I feel that the B.V.A. accomplished a most valuable piece of work in bringing about this new state of affairs, when dogs suffering from these conditions, or having had them surgically corrected, can no longer win championship prizes. They are, therefore, likely to be used at stud on a steadily decreasing scale, to the lasting benefit of the various canine breeds.

Certificates of Non-pregnancy

"In the large-animal field we have been able to come to a better understanding with the Fatstock Marketing Division of the Ministry of Agriculture over difficulties arising from the rejection, by grading officers, of veterinary certificates of non-pregnancy. This matter was fully described in THE VETERINARY RECORD of July 5th this year, but in substance it has been agreed that the Ministry's officers will always take note of properly completed veterinary certificates and of veterinary advice given

on 'suspect' animals. Where the grading officer does not agree with the advice given he will seek the opinion of a superior officer, and will report to the producer of the animal and his veterinary adviser. This state of affairs, while not ideal, is at least a considerable advance on the system previously in force whereby our expert advice could be—and far too often was—rejected out of hand.

"It is a matter of regret and of deep concern to us that the Treasury and National Whitley Council (Staff side) promulgated a new set of figures for car mileage allowances. As taxpayers we may be glad of any effort made to curtail the ever-increasing expenditure of public money—especially unnecessary spending—but these new allowances make cars of over 10 h.p. uneconomic whatever the mileage on official business. For those who use cars of less than 10 h.p. or who do 4,000 to 10,000 miles on Ministry work there may be a slight advantage, but the majority of L.V.I.'s seldom do such mileages. What makes matters worse is that mileages under 1,000 will have to be subsidised out of the earnings of private practice. It is the intention of the B.V.A. to pursue this matter and I earnestly hope that reconsideration will be given to it promptly so that mileage allowances are placed upon a more realistic footing. It must be obvious that the costs of running a car must be based on total mileage instead of trying to divide off part of it which, as I have just said, may well result in official mileage being paid for out of other earnings.

Guide Dogs for the Blind

"A matter which gives me very much pleasure and will, I am sure, give equal pleasure to you, is that from next month your Association has promised that veterinary surgeons will give a six-monthly examination, free of charge, to all guide dogs belonging to blind people. There is no need for me to commend to you so worthy an object, and I am certain that every veterinary surgeon will gladly give his services so that all dogs belonging to blind people may benefit from our knowledge and experience.

"Thoughtful people in the profession are beginning to ask themselves what may be the effect on veterinarians when all cattle in the United Kingdom are attested. The virtual eradication of bovine tuberculosis by 1961 or 1962 will rank as one of the greatest triumphs of our profession and it is to be hoped that thereafter our services will again be utilised to the full in attacking one or more of the other great scourges. I refer, of course, to such conditions as Johne's disease, brucellosis and swine fever, which in the opinion of many people cause economic losses comparable to those from tuberculosis. Additionally, in a case of brucellosis there is the matter of human health to be considered. It may be, therefore, that a future government will decide that the eradication of such conditions should be attempted on a nation-wide scale. In that case our profession would have the opportunity of serving the community and at the same time employing its own manpower to the full.

"This glance forward leads me to note, with pleasure, the high quality of the new graduates entering our profession. These young men and women have received a training, and are accustomed to the use of therapeutic agents, beyond the imagination of many of us when we first entered the profession. It is a satisfying reflection that the prestige and honour of veterinary science will be in good hands when the new graduates become, in time, principals of practices, senior research workers, and teachers.

"Speaking of teachers prompts me to pay tribute, as your President, to the very high quality of the teaching in our veterinary schools. As you know, the schools became integrated within the Universities under the 1948 Act, and I feel that the entire profession is in the debt of our teachers who have so amply illustrated to their university colleagues in other faculties the qualities of our science.

B.V.A. Publications

"In concluding these random observations about our domestic affairs I should like to draw your attention to the increasing importance of the publications produced by your Association. Few things are of greater importance than to spread our knowledge, and our own VETERINARY RECORD remains the only weekly journal in the English speaking world devoted exclusively to the art and sciences of veterinary surgery. Under its able committee THE VETERINARY RECORD has made gratifying progress in the past decade. The Editorial Committee is examining the prospects of producing, in addition to THE RECORD, a quarterly research journal of the very highest quality. I must not comment on this as detailed proposals have not yet been made by the committee to your Council; but certainly if this ambitious project is found to be feasible I think you will agree that it will help us notably to further the first of the objects for which the Association is established, that is 'the promotion and advancement of veterinary and allied sciences.'

"It is with some satisfaction that I report cordial discussions with the Automobile Association with the aim of having the names of the nearest veterinary surgeons made available in the A.A. roadside boxes. This will help to provide that skilled treatment is available for animals injured in road accidents or taken ill while travelling, and so reduce animal suffering. It will also be useful to patrols to know whom they may consult in such difficulties.

"It has been agreed that the A.A. would be prepared, with the help of the B.V.A., to display the names of the nearest veterinary surgeons in most A.A. boxes, though it was appreciated that in certain heavily populated areas the list of available veterinary surgeons might not contain every name or it would be too cumbersome. The A.A. suggested that their patrols would call on veterinary surgeons where there was an A.A. box in the vicinity to ascertain if they would agree to their names being put in the box. The B.V.A. has undertaken to help in compiling the lists of veterinary surgeons' names and to be consulted on any difficulty that may arise in establishing this emergency service.

"The A.A. had some apprehension that some of their members, even when not involved in the accident in which the animal had been injured, might be called upon to pay the veterinary surgeon's fee. It was pointed out that in many cases the R.S.P.C.A., when advised by the police, frequently met nominal fees for cases of injured animals where the owner was unknown. In any case I feel sure that the long tradition of humanitarian behaviour which is honoured by veterinary surgeons everywhere, would urge us to go to the help of an animal in real distress without the subject of fees entering our minds.

Representation on Official Bodies

"Turning now to what I may call the public aspects of our work, it is still to be deplored that the Government, and official bodies generally, make so comparatively little use of our expert knowledge. There is an honourable exception in the new Pig Industry Development Authority, which has set up a veterinary committee after consultation with your Association and the R.C.V.S., but you will all be aware that committees and commissions are appointed over and over again to deal with agricultural subjects and have either very few or no veterinary representatives. Even in such a matter as the inspecting of animals kept at various institutes for experimental purposes there is not, to the best of my knowledge, a single veterinary officer employed. Yet who can possibly have comparable qualifications for carrying out this important work? Veterinary surgeons know that, however repugnant it may be to some minds, experiments upon living animals are essential for the advancement of science. But the protection to be afforded to such animals is a matter of conscience to every right-thinking person, and that protection should be in the hands of our own profession.

"It is impossible to speak of our lack of representation on public bodies without the subject of meat inspection coming into all our minds. The arguments in favour of veterinary participation in meat inspection have been repeated so often, and are so familiar to you all that I need not recapitulate them here; but our Association notes with some concern the extent to which the Government's failure to keep to its original policy of concentration of slaughter has led to difficulties in providing an adequate meat inspection service. It is no credit to a civilised community that a considerable proportion of meat escapes inspection. If the public knew the real state of affairs how long would this be tolerated?

"We have considerable sympathy with a Public Health Inspectorate, already overburdened with many other duties, which has to cope with the present situation, but the continued failure of both Government and public health authority to make use of the skill and knowledge of three thousand veterinary surgeons up and down the country, whose training fully fits them for really skilled meat inspection and whose participation could go far to help remedy the present situation, is perturbing indeed. The difficulty cannot be purely financial, as is made clear by the situation north of the border where meat inspection has been for over 30 years almost entirely supervised by members of our profession. No one would ever consider the Scots guilty of throwing away money unnecessarily!

"Apart from all other benefits veterinary participation in meat inspection, by procuring information from *ante-mortem* and *post-mortem* material at research laboratories, and from there back to the man in the field, could be the essential link completing the chain between the scientific and practical branches of our profession, bringing about the complete 'follow-up' of diseases which we hope to control or eradicate. We can only continue to try and impress upon the authorities the importance to public health of such inspection by those with the only appropriate qualifications. This has long since been recognised by almost every other civilised country. For example, the Italian Government has just passed an edict to the effect that imported meat must carry a veterinary certificate of both *ante-* and *post-mortem* inspection. Ironically enough, meat imported into our own country requires a veterinary certificate—yet home-grown meat requires no such certificate. It would seem that the authorities accept the principle of veterinary inspection so long as it applies to meat from other countries and not from our own.

A Twenty-four Hour Service

"Turning to another subject altogether, I should like to refer to the 24-hour service 7 days a week which veterinary surgeons can and do provide where ever this is even remotely feasible. I am, however, somewhat alarmed at the increasing demand, especially in the summer, which is made upon our services at most unreasonable times. In my own experience many of these demands could be dealt with during ordinary hours—hours which by any comparison are long enough already. No professional man expects regular periods of private time, but we are surely entitled to a few hours when we should only be called out for urgent reasons. I wonder whether the number of trivial or even imaginary ills for which our attention is demanded is not linked with the criticism sometimes made—especially in cities—that people have difficulty in finding a veterinary surgeon at night or on Sundays. Naturally, we, as a profession, are willing and more than willing to go at any time to an animal that needs our services; but it is difficult not to become sceptical when one experiences the annoyance and frustration of unnecessary calls, and we do appeal to animal owners not to abuse this 24-hour, 7 days a week service. It surprises me that to-day, when the trend is for shorter hours in all walks of life, we as a profession are supposed to go on working for longer and longer hours day and night.

"For some time past there has been a very proper and necessary control over the advertising of patent medicines for human beings. I think it should be generally known that we have established a liaison committee with the pharmaceutical industry with the intention of presenting a new Bill in

Parliament to control advertisements of patent medicines alleged to cure animal diseases. It is important to state that the Pharmaceutical Society, the Association of the British Pharmaceutical Industry, the National Farmers' Union, the Royal College of Veterinary Surgeons and the British Veterinary Association are in agreement with the principles of the proposed legislation.

"Further, it should be appreciated that such legislation in no way restricts the liberty of the farmer to buy patent or other medicines, but will make it possible to ensure that what he does buy has some therapeutic value. The same thing applies to food supplements and additives—the aim is to see that supplemented feed really does contain chemotherapeutic substances in active form.

Nuclear Dangers

"You will, I am sure, approve the steps we are taking to try and ensure that veterinary surgeons shall be better informed about the risks to agriculture of atomic fall-out, and what they can do in their professional capacity in the event of an accident such as that at Windscale, or of atomic warfare. We have, therefore, formed a sub-committee on this subject to discuss and arrange how the profession shall be utilised in its widest capacity in any emergency which might arise. It is envisaged that a 2½ day course will be arranged at an early date at the Civil Defence Staff College at which representatives from all of our Divisions, and from the teaching Schools, will meet to discuss and elaborate with the various authorities concerned the fullest use of our profession within the Civil Defence organisation. Further details will be made available to our members after this subject has been before our Council.

The Road Ahead

"In conclusion, I should like to dwell for a moment upon the position of the veterinary surgeon in the community. With the increasing studies that are being made in preventive medicine our attention is moving rapidly from the individual animal to the flock. There has come into being also a diverse body of those whom one may call scientific advisers to the agricultural industry, ranging from agronomists to biochemists, and from nutritionists to endocrinologists. The danger is that as each specialist digs deeper in his chosen field, the accumulated mass of knowledge will be increasingly difficult to grasp and to apply. We should think along the line that the modern veterinary surgeon must become the hub of the wheel, and be the source through which this knowledge is applied on the farm. As a profession we must broaden our horizons to the uttermost, not be content to be what Xenophon called 'doctors of oxen and asses,' but qualified expert advisers on the whole economy of the farm. An enormous field stretches before us when we reflect that, even in this country, losses in farm livestock—many of them avoidable—have been estimated by O.E.E.C. at up to £100,000,000 a year. In over two-thirds of the globe vast populations are suffering from malnutrition. We may take a reasonable and proper pride in the achievements of our practitioners, of our scientists, of those who have gone into colonial and foreign territories and laboured heroically to improve the native agriculture, and in our teachers who by training Asiatic and other veterinarians have made it possible for them to help their own communities. Let us, as a profession, accept the challenge of the times, and continue to equip ourselves to meet the world-wide need for our services. I truly believe that by helping to provide food and other animal products such as clothing to hungry and discontented millions, we may play our part in doing more to advance the peace and progress of mankind than all the politicians put together. Do not let us be afraid of surveying broad horizons and of making great endeavours; for as a poet has said, 'a man's reach must be further than his grasp, or what is Heaven for?'"

EXTENSION OF TUBERCULOSIS ATTESTED AREAS

The Ministry of Agriculture reports that good progress continues to be made in eradicating tuberculosis from cattle in Great Britain. The disease has now been cleared from herds in the 5 further areas—2 in the south of England and 3 in Scotland—that were declared Eradication Areas on March 1st, 1958. The 5 Eradication Areas were declared in counties in the south-east and south-west of England, and in north, central, and south-east Scotland. Compulsory tuberculin testing has since been carried out there of herds which were not attested on that date. Cattle reacting to the test have been removed and slaughtered and the Areas are now ready for full Attested status. Under Orders made by the Minister of Agriculture, Fisheries and Food and the Secretary of State for Scotland, they will be declared Attested Areas as from October 1st, 1958. With the declaration of an Attested Area the control by licence of cattle movements *within* the area is relaxed, but prohibition of movement of cattle *into* an area, except under licence, continues.

At June 30th, 1958, there were about 7.8 million cattle in Attested Herds and Attested Areas in Great Britain as against 3.9 million 5 years ago and 1.4 million 10 years ago. Eighty per cent. of the cattle in the country are now attested; in England 72 per cent., in Wales 94 per cent., and in Scotland 95 per cent. Over 4.5 million cattle—nearly a half of the total in Great Britain—will be in Attested Areas as at October 1st, 1958, and there are a further 5.25 million cattle in areas which are now being developed, with the assistance of free tuberculin tests, with a view to their declaration as Attested Areas during the next 2 years.

An Outbreak of Aldrin Poisoning in Suckling Lambs

BY

J. K. L. PEARSON, J. R. TODD and Miss S. BAIRD

Ministry of Agriculture for Northern Ireland, Veterinary Research Division, Stormont, Belfast

SUMMARY.—A case is reported in which 105 out out of 107 lambs died of aldrin poisoning as a result of misuse of an insecticide preparation containing aldrin. Clinical symptoms are described in animals at various stages after exposure and post-mortem *and histological examination of seven lambs are described.*

Introduction

RECENT developments in the chemical control of weeds and insects, although of great benefit to agriculture, have created new hazards in that most of the chemicals are toxic to animals. The chlorinated hydrocarbon group of insecticides has assumed considerable importance in soil treatment because they are chemically stable and have a moderately prolonged effect. One of this group, aldrin, is a chlorinated naphthalene derivative and is commonly used as a treatment against wireworms, leatherjackets, cutworms, cabbage root fly, etc. It is one of the most toxic of this group (Barnes, 1953; Radeleff *et al.*, 1955) and McGirr (1956) quotes the lethal oral dose for sheep to be in excess of 10 mg. per kg. bodyweight and, for cattle, between 10 and 25 mg. per kg. The symptoms of acute poisoning include hypersensitivity, muscular tremors, paralysis, convulsions, salivation, grinding of the teeth and loss of appetite. There is no specific antidote, but as calcium decreases the toxicity of chlorinated hydrocarbons (Bensley & Joron, 1958) it is usually recommended that calcium borogluconate should be given intravenously. Supplementary treatment consists of controlling hyperexcitability by small doses of barbiturates.

Although laboratory studies of the toxicity of aldrin are fairly complete we are not aware of any recorded cases of aldrin poisoning among sheep under field conditions, and the object of this communication is to record a case in which more than 100 lambs died as a result of misuse of one of the proprietory aldrin insecticides.

History of Outbreak

The outbreak was brought to our notice by Mr. M. J. Coyle, M.R.C.V.S., who stated that a client of his had applied a preparation of aldrin to the mouths of over 100 suckling lambs 24 hours previously. Eight lambs had died within 4 or 5 hours, and at 24 hours over 30 had died and all others were sick. Fits, lethargy, inappetence and salivation were the predominant symptoms.

An insecticide containing aldrin had been applied undiluted to the mouths of the lambs with a view to killing a virus infection called orf (contagious pustular dermatitis), the farmer in good faith relying on this newly found drug which was so effective in wireworm control! The lambs were 5 to 9 weeks old and about 40 per cent. were affected with orf. The muzzle of each lamb had been immersed for a few seconds in the insecticide concentrate and no other treatment given.

Symptoms

The lambs were not seen by us until 24 hours after the insecticide was applied. Eight lambs had died within 4 hours showing acute symptoms of poisoning; salivation, distress and violent fits and convulsions being reported by the owner.

At 24 hours more detailed observations were made, the predominant symptoms then being dullness, bleating, inappetence, tetanic spasms and fits, salivation and blindness.

Over 30 lambs were then dead. The majority of the others were standing listlessly in the yard or wandering aimlessly. They were blind to varying degrees and if by chance reached a dark corner tended to stay there. All had been taken from the field as they failed to recognise their dams. Some lambs bleated pathetically but few appeared to hear clapping or shouting noises. Several were grinding their teeth and all were salivating and frothing at the mouth, the latter symptoms perhaps in part resulting from local irritation by the insecticide but mainly due to vagal stimulation by aldrin. The buccal mucosa was not markedly inflamed.

Breathing was exaggerated only in those lambs just out of a fit or about to die following coma. Temperatures were normal and no effect on bowel movement was seen.

Fits are apparently a feature of aldrin poisoning and were certainly an outstanding symptom in this outbreak. They had been seen in the majority of lambs which had died prior to our first visit and at 24 hours 4 or 5 lambs showed tetanic spasms and fits while we were on the farm. Only one lamb appeared to enter a fit as a result of external stimulus, the others merely stopping in their tracks and going into a tetanic spasm without apparent reason.

The lambs remained standing and shook convulsively, the ears were laid back and the head tucked downwards towards the chest. Both the forelegs and the hind legs were rigidly extended forwards. The convulsive movements of the lamb made it move backwards involuntarily for several yards. If the convulsion was severe it fell on its side. Muscle spasm remained for 2 to 3 minutes and the lamb became dull, listless and insensitive as before.

Before death supervened the lambs tended to breath more quickly for 5 to 10 minutes, and finally fell on their sides and began a paddling movement of the limbs. This stage might not be reached until the lamb had had several fits. Death was rapid in onset following the loss of control of the limbs.

Forty-two hours after aldrin application two of us (S.B. & J.R.T.) again visited the farm. Only 4 further

XUM

lambs had died, the total dead now being 42. The clinical picture was slightly different from that seen at 24 hours; grinding of the teeth now being common among sick lambs and the fits being less convulsive. The head was thrown backwards over the neck and not held down towards the chest as before. Tetany of the main limb muscles was not so severe as on the previous day and few lambs had the ability to stand during a fit. Many lambs in fact showed extreme lethargy and on handling were quite incapable of limb movement or resistance in any form. Blindness was still present in the majority of the lambs.

At 72 hours no more lambs had died but the clinical picture had again slightly changed. A number of lambs appeared to be improving and some could definitely see and recognise their dams and attempt to suck. Several others made half-hearted attempts to drink water or nibble grass—a natural reaction as by now their last feed had been nearly 3 days previously. Most of the ewes were reluctant to take their lambs at this stage because of udder congestion and possible mastitis, though some did make an anxious search for their own lambs.

Fits were still observed but these occurred less frequently. Weakness from starvation was influencing the clinical picture and many lambs were hardly able to walk. Bottle feeding was started on some of the stronger lambs and 3 were brought back to the laboratory in an attempt to assist in this way. A new symptom among the stronger lambs was now seen—a tendency to run away and keep running. One was followed by the farmer for 2 miles and never caught, and one of those brought to the laboratory was with difficulty retrieved about a mile from the place the following day.

Between the fourth and seventh days after treatment with aldrin a further 60 lambs died. The farmer reported that hypersensitivity and convulsions were constant features in those lambs seen dying. Three lambs brought back to the laboratory on the fourth day also died during this period. Two of them died following convulsions—one after a prolonged fit which was relieved for only a short time by nembutal. The third—the one which had shown the "running-away" symptom—apparently died quietly as its bedding was not disturbed.

On the seventh day, when only 5 of the treated animals were still alive, 2 were brought back to the laboratory, and hand fed with both grass and milk. One died on the 9th day in convulsions after showing distressed breathing during the last 12 hours and the other, in spite of treatment with calcium borogluconate and penicillin, died on the 15th day. It also showed lung symptoms latterly including early bronchitis but did not have terminal convulsions.

Post-mortem *Findings*

Seven lambs were examined at *post mortem* and material from each submitted for histological examination. Nos. 1 and 2 died at 24 hours after treatment and were brought back from the farm at our first visit. Nos. 3 to 7 were brought back alive to the laboratory, but died at 4½ days, 6 days, 7 days, 9 days and 15 days following the aldrin application.

Nos. 1 and 2 showed macroscopic liver and lung changes, the former being pale and even cream in colour probably as a result of severe degeneration. The lungs were acutely congested but there was no pneumonia nor bronchitis. Neither the kidneys, brain, nor bowel showed naked eye lesions.

Liver changes were not so marked in Nos. 3, 4 and 5 and were hardly visible in the lamb dying on the 9th day (No. 6). The liver of No. 7 appeared to be normal. Lung lesions on the contrary appeared to be more severe in the later lambs and in addition to congestion, some pneumonia was present in No. 5 (7 days) and an early bronchitis was found in Nos. 6 and 7.

Histology

Histological examination revealed lesions of early onset following the poisoning. They consisted of foci of degeneration in the forebrain and degenerative changes in the liver and kidney. Apart from the kidney lesions, which did not appear to heal in any of the lambs studied, the changes were reversible. The lung condition was not of long standing and essentially it was an acute, severe terminal congestion. The serial pathology of the present cases is described in more detail in a separate paper (Baxter, 1958).

Discussion

The symptoms described are typical of poisoning by chlorinated hydrocarbons (Garner, 1957) and in fact the insecticide used did not contain any dangerous material other than aldrin. It contained 3 lb. of technical grade aldrin per gallon, and, from the method of application, the aldrin could have been absorbed by 3 different routes (a) directly through the skin of the nose and through the lesions of the orf; (b) by inhalation and absorption through the lung tissue; (c) by ingestion and absorption through the alimentary tract.

Of 107 lambs treated with the aldrin 105 died and the mortality occurred in 2 clearly defined periods. About 45 per cent. of the casualities occurred within 36 hours of treatment. There were then no more deaths until the fourth day but on the seventh day only 5 lambs were still alive. Starvation was probably indirectly concerned in the deaths during the second period in that aldrin is stored in the body fat and the mobilisation of fat during starvation releases the aldrin with consequent toxic effect.

The farmer himself was extremely lucky not to have suffered poisoning effects. He had used his bare hands for over an hour to swab the lambs' mouths in the tin of aldrin concentrate and his hands were saturated. A neighbour assisting him had in fact been splashed on the mouth and remarked on its unpleasant taste. Fortunately no harmful effects were seen in either man.

This outbreak of poisoning was caused by misuse of a potent insecticide, although the label gave detailed instructions as to the use of the material and precautions to be observed. In this connection we quote the working party on Toxic Chemicals in Agriculture (1951) reporting on the organophosphorus insecticides and aromatic dinitro weed killers. "In our view the labels of the containers should contain in large letters the words, 'Deadly

(*Concluded at foot of col. 1, opposite*)

Some Cases of Arsenical Poisoning

BY

W. GRIFFITH JONES

Atherstone, Warwickshire

Introduction

THE incidence of cases of arsenical poisoning appears to be increasing due to the more widespread use of arsenical sprays for the destruction of potato haulms. Arsenic is again becoming a strong challenger to lead as the foremost toxicological hazard to livestock. Out of 24 animals encountered with arsenical poisoning all but 2 have been a sequel to the use of these potato sprays. The source of arsenic in these 2 animals was found in an old sheep foot-bath. The incidence of arsenical poisoning, due to the treatment of potato haulms, is seasonal and occurs chiefly in September. With the exception of 4 dogs, all the other cases have involved cattle.

Arsenical sprays are favoured by farmers because they are (a) cheap; (b) do not cause damage to clothes of workers and machinery (as in the case of sulphuric acid sprays); (c) easy to handle and do not require such specialised equipment as some types of spray. The hazards, however, are potentially far greater. On one farm, out of a total of 18 cattle poisoned with arsenic, 7 died.

History of Main Outbreak

A potato field was sprayed with a mixture of sodium and potassium arsenite, and 2 hours later 12 store cattle got into the field through a broken fence. It is estimated that they were there for one hour. Six milking cows also grazed sprayed nettles in the hedgerow surrounding the potato field. Professional advice was sought 36 hours later when 2 animals were found dead, 1 prostrate, 2 staggering, and the rest exhibiting symptoms of gastro-enteritis to a varying degree.

Clinical Signs Observed

After a latent period, the onset of symptoms was rapid. Within 4 hours of the first visit the prostrate and staggering animals were dead; in a further 48 hours 2 more had died. The other main features observed were:—

(a) Severe abdominal pain and dejection with profuse diarrhoea, slight salivation, teeth grinding, intense thirst and dehydration which, in a few cases, was extreme.

(b) Stiffness of limbs and reluctance to move. Animals were frequently lying down or when standing alternately rested a leg to ease the pain. In addition they flicked a hind leg backwards characteristically as is sometimes seen in an animal with a pebble stuck in the inter-digital space.

(c) The temperatures varied from subnormal to 102½° F.

The respiratory rate was increased in a few cases but this was not a marked feature as a whole.

(d) Anorexia and a fall in milk yield (6 cows).

(e) The course in animals showing advanced symptoms was rapid and terminated fatally within 40 hours of the ingestion of arsenic. Animals which became recumbent within 96 hours also appeared to have ingested a lethal dose. In the other animals the appetite either returned or improved after 48 hours and the diarrhoea stopped during the ensuing week.

Arsenic in the alimentary tract acted as a caustic and escharotic causing the main symptoms. After absorption the other pharmacological properties of arsenic became apparent: acting as a protoplasmic poison, it caused rapid collapse and death once toxic amounts had been assimilated. The interval between the onset of inco-ordination and death was less than 3 hours.

Post-mortem Findings

(a) Acute and extensive haemorrhagic gastro-enteritis with the mucous membrane swollen and dark red in colour.

(b) Degeneration of the liver.

(c) Soft haemorrhagic spleen pulp.

(d) Erosion of joint cartilages forming deep ulcers with red bases. This was most marked in the hind limbs and the cartilages of the hock joints in particular.

(e) Slight congestion of other organs, *e.g.* lungs.

Chemical Analysis

Portions of liver and omasal contents were placed in polythene bags and sent for analysis. The former

---

An Outbreak of Aldrin Poisoning etc.—*Concluded.*

Poison,' short statements of the danger and precautionary measures to be taken and a minimum statement of the purposes for which the product is to be used. It is useless and dangerous to print so much material on a label that a man cannot readily understand its vital message when he has read it once."

Although aldrin, and many other pesticides are not scheduled poisons they can be dangerous to man and animals. The farmer must, therefore, be educated in the use of these preparations and it may be more important in some cases to emphasise the dangers rather than the benefits accruing from their use.

References

BARNES, J. M. (1953). "Toxic Hazards of Certain Pesticides to Man." W.H.O. Monograph Series No. 16.

BAXTER, J. T. (1958). *J. comp. Path.* In the press.

BENSLEY, E. H., & JORON, G. E. (1958). "Handbook of Treatment of Acute Poisoning." 2nd ed. E. and S. Livingstone

GARNER, R. J. (1957). "Veterinary Toxicology." Baillière, Tindall & Cox, London.

MCGIRR, J. L. (1956). *Vet. Rec.* **68**. 902.

RADELEFF, R. D., WOODARD, G. T., NICKERSON, W. S., & BUSHLAND, R. C. (1955). Tech. Bull. No. 1122, U.S. Dept. Agric.

"Toxic Chemicals in Agriculture." Report of the Working Party. H.M.S.O., 1951.

showed arsenic at levels around 10 p.p.m and omasal contents were positive to the Reinsch test. This work was carried out by Mr. W. H. Parker at the Veterinary Investigation Centre, Wolverhampton.

The diagnosis was based on very strong circumstantial and presumptive evidence, symptoms and lesions. This was confirmed by the chemical analysis.

Treatment

1. *Chemical antidotes.*

(a) Moist ferric hydroxide. This was freshly prepared by mixing:—

3 parts solution of perchloride of iron.
17 parts water.
1 part calcined magnesia.

Most animals received an initial dose of 20 oz. *per os*. This was repeated in 24 hours.

C.F. Sodium thiosulphate.

British anti-lewisite.

These drugs were not used but they do present a means of combating the effects of assimilated arsenic. British anti-lewisite however is not very effective in inorganic poisoning (R. J. Garner).

2. *Demulcents and Mechanical Protectives.*

(a) Eggs beaten up in milk.

(b) Kaolin.

3. *Purgatives.*

(a) Saline drenches.

(b) Carbachol—2 c.c. parenterally.

4. *Other Treatment.*

Glucose and calcium borogluconate solutions were given intravenously to counter shock and attempt to limit liver damage.

Morphia was given where an animal was in great pain.

5. *Management.*

Animals were given unlimited water but no food or bedding for 48 hours. An endeavour was made to empty the alimentary tract of contaminated food. After this period a high carbohydrate diet including good hay was allowed.

Other Cases

(a) Two in-calf Friesian heifers were poisoned by residue in a sheep foot-bath. One heifer died within 15 hours of access to the source of poison. The second heifer had gastro-enteritis and joint stiffness but recovered.

(b) Circumstantial evidence suggests that 4 gundogs were poisoned as a result of skin contamination due to their crossing a field of potatoes 5 days after spraying. There was a longer latent period in these cases due to arsenic being licked off their coats in small quantities and over a longer interval. The most prominent symptoms were vomiting and diarrhoea with a capricious appetite. Toxic jaundice and death was the sequel in one case. Another dog developed an intussusception with prolapse through the anus. Surgical intervention was not successful and the owner's permission was obtained to destroy the dog. The other two dogs recovered slowly over a period of one month.

Discussion

(a) *Spraying Procedure.*

Three gallons of a mixture of sodium and potassium arsenite were mixed with 90 gallons of water and the potato crop sprayed at the rate of 30 gallons to the acre. This gave 10 lb. $As._2O_3$ equivalent to the acre. The lethal dose of this for cattle is 1 to 4 gm. (J. L. McGirr). Hypothetically this gives one lethal dose sprayed on each square yard at the lower level of toxicity.

(b) *Legislation.*

Legislation enforces an interval of 10 days between spraying and harvesting of potatoes. Spray manufacturers state that after this period the arsenites have been mostly converted to the less toxic arsenites. There are no Ministry of Agriculture Regulations controlling the use of arsenical sprays. However, some sprays are covered by the Agriculture (Poisonous Substances) Act.

Conclusion

The cost of arsenical sprays is only slightly less than those containing sulphuric acid. The danger to livestock of arsenic is only too evident.

The hazards are increased due to:-

(a) Carelessness—*e.g.* containers left about or gates not closed, poor fencing.

(b) Lack of appreciation by lay persons of the high toxicity of some arsenical preparations. This may be due in part to compounds containing arsenic being used as internal as well as external parasiticides.

(c) No warning notices being displayed. Owners may thus allow dogs to traverse sprayed fields.

The warnings on labels by manufacturers appear adequate.

There is no doubt that the use of defoliants confers many advantages in the mechanical harvesting of potatoes; from the point of view of animal health, however, it seems that arsenical sprays are not the ones of choice.

References

GARNER, R. J. (1957). "Veterinary Toxicology." Bailliere, Tindall & Cox, London.

McGIRR, J. L. (1956). *Vet. Rec.* **68**, 902.

POULTRY STOCK IMPROVEMENT PLAN: PROGENY TESTING SCHEME, 1958

The rearing of the pullet chicks hatched from eggs submitted to the three poultry progeny testing stations, Levens Hall, Wheaton Aston, and Phoenice, in 1958 was concluded by the end of August. The individual records of entries are communicated only to the entrants. The total number of pullet chicks started was 11,343 as compared with 9,546 in 1957. The death rate (excluding accidents) was slightly higher than in 1957, and coccidiosis has been troublesome at all three stations.

The regulations of the test provide that for the 5-month rearing period a maximum of 70 marks may be obtained by entries that suffer no loss except through accident. Deductions from this maximum are at the rate of 3 marks for each 1 per cent. mortality rate of all female chicks started. For all three stations taken together the total entries losing no marks declined from 33.98 per cent. in 1957 to 20.98 per cent. in 1958, while the number losing up to 20 marks increased from 39.16 per cent. to 45.98 per cent. As between the three stations, entries with scores of 50 or more amounted to 56.08 per cent. at Levens Hall, 57.68 per cent. at Wheaton Aston, and 83.85 per cent. at Phoenice.

Comparative Trials with Ammonium Sulphate, Sulphonamides and Antibiotics in Natural Bovine Coccidiosis

BY

G. GASPARINI, R. RONCALLI and G. F. RUFFINI

Centro Sperimentale di Terapia Veterinaria, Università di Milano

SUMMARY.—Two outbreaks of bovine coccidiosis affecting 46 cattle were controlled by ammonium sulphate, sulphaguanidine, sulphamethazine, sulphonamide mixture, framycetin and tetracycline by oral route. The best results were reported with sulphonamides and ammonium sulphate. These drugs brought about either the disappearance of oöcysts from faeces or the rapid improvement of general condition. Framycetin and tetracycline, although producing the disappearance of oöcysts and blood from faeces, did not suppress diarrhoea.

BOVINE coccidiosis, though it is not very common in Italy, may sometimes in its acute form produce greater harm than is usually supposed.

In the alpine zones where our trials have been carried out, bovine coccidiosis is, in fact, after foot-and-mouth disease, the most senior disease, affecting in certain years 70 per cent. of the calves summering in the Alps with a 10 to 15 per cent. mortality.

Outbreaks of this affection in cattle are encouraged, quite independently of age, by bad sanitary and climatic conditions. Therapy of bovine coccidiosis is to-day undertaken with various drugs of different chemical natures, and often with dissimilar results.

In the following review of the literature, we only relate the most important reports referring to the drugs examined by us.

Ammonium sulphate

In 1956 Petrov obtained promising results with ammonium sulphate in 5 calves experimentally infected with oöcysts of *Eimeria zürnii* and, in a practical field trial, in 175 cattle affected naturally with coccidiosis.

The activity of ammonium sulphate is due to the property of ammonium salts to liberate ammonia, which, as Metelkin rightly observed in 1941 in confirming Horton-Smith's *et al.* reports (1940), is highly lethal to the oöcysts of Coccidia. The ammonia is formed from ammonium sulphate in the presence of alkalis according to the following reaction:—

$$(NH_4)_2SO_4 + 2NaOH = 2NH_3 + Na_2SO_4 + 2H_2O$$

Some lactic acid is added to the ammonium sulphate so as to prevent the precocious decomposition of the salt in the stomach of cattle.

Positive results were also obtained by Petrov (1956) in the prophylaxis of coccidiosis with ammonium sulphate in 56 calves of one herd, in which coccidiosis was present in 15 subjects; conversely, in another herd, which was not treated, the disease assumed very great proportions.

Sulphonamides

McPeek and Armstrong (1941) first found that sulphonamides (sulphanilamide) might be of value to control bovine coccidiosis.

Boughton (1943) and Boughton and Davis (1943), contrary to Arthur (1944), reported promising results with sulphaguanidine for the treatment of experimental and natural bovine coccidiosis by *Eimeria bovis, E. ellipsoidalis* and *E. zürnii*.

Maglione and Vacirca (1954) have obtained satisfactory results by administering sulphaguanidine or sulphamethazine in the treatment of *E. zürnii* infections. Lei (1955) reported that rapid and complete recovery was obtained with sulphaguanidine or sulphamerazine in 12 cattle seriously affected with *E. zürnii*. According to Simms (1948-50) and Mortelmans *et al.* (1953) sulphamethazine is of value for prophylaxis and treatment of bovine coccidiosis.

Davis and Bowman (1951) in two experiments comparing sulphamethazine and sulphaquinoxaline, using control calves, found that sulphamethazine gave more protection than sulphaquinoxaline.

Fox and Roberts (1949) reported positive results in 19 cases of coccidiosis in cattle with sulphathalidine and sulphamerazine or sulphamethazine orally for 2 or 3 days. The simultaneous administration of the 2 sulphonamides is thought to have a twofold action inasmuch as sulphamerazine (or sulphamethazine) attacks the schizonts in the epithelial cells and the merozoites when they are free in the intestinal wall, whereas the sulphathalidine cuts down intestinal bacterial flora and thus controls the secondary infections.

Davis and Bowman (1954) gave 28 calves (half previously treated *per os* with sulphamethazine, the others being left as untreated controls) a large number of oöcysts and observed that the 14 treated calves were less affected.

Sulphaquinoxaline however used (Dunlap, 1949; Frank, 1949; Simms, 1949; Neal, 1956) and advised (Pennings, 1952; Foster, 1953) in bovine coccidiosis was not employed in our trials, on account of several negative properties: short blood levels, rapid excretion through the kidneys, serious toxic effects following both oral and intravenous administration (Stowe *et al.*, 1957).

Antibiotics

Favourable results were reported by Lucas *et al.* (1956) in 2 6-month-old calves showing coccidial infection by oral administration of framycetin, at doses of 0.5 g. for 3 successive days. Barrows (1957) has treated some 20 cases of bovine coccidiosis with oxytetracycline by intravenous, intramuscular or intraperitoneal routes with better results than those

previously obtained with dihydrostreptomycin and sulphonamides.

The purpose of the present investigation was to carry out comparative trials (by the oral route) with ammonium sulphate, sulphaguanidine, sulphamethazine, a sulphonamide mixture (sulphadiazine, sulphamerazine, sulphamethazine and sulphathiazole, *ana* 25), framycetin and tetracycline in naturally acquired bovine coccidiosis with a view to finding, if possible, a treatment that is both effective and economical. Low cost is, in fact, a very important factor in alpine localities, where economy may determine whether or not a parasitized animal may be treated.

Materials and Methods

In our trials, carried out during the summer of 1957, a total of 46 Brown-Swiss cattle were treated. The subjects were summering in two localities of the high Spluga and Lesina valleys where the affection due to *Eimeria zürnii* took place at about the same time.

In each locality we tried as far as possible to treat, with each single drug, groups of animals of the nearest possible age and weight. The clinical diagnosis of coccidiosis was always checked by a microscopical examination of faeces according to the Sheather's method, modified by Benbrook and Sloss (1955). In each animal the microscopical examination was repeated many times, as in hyperacute cases, in which haemorrhage precedes the liberation of oöcysts, it may prove negative (Steward, 1947). To judge the value of the various drugs in all the cattle affected no other therapy (such as astringents, cardiotonics, dextrose and sodium chloride solutions etc.) was ever applied.

First outbreak (*Spluga valley*)

In a herd composed of 287 cattle the coccidiosis affected, within 35 days, 26 subjects, 1 of which, not being treated, died. All the animals affected presented emaciation, weakness, rough coat, normal temperature (very rarely subnormal or feverish), pulse generally quick, fair tachypnoea, loss of appetite. In the most serious cases anorexia, intense thirst and profuse diarrhoea, dark and sometimes haemorrhagic, were noticed. During the outbreak 25 cattle were treated *per os*: 8 with ammonium sulphate, 5 with sulphaguanidine, 3 with sulphamethazine, 4 with framycetin and 5 with tetracycline.

The ammonium sulphate was used in doses of 4 g. per 100 kg. of bodyweight in one litre of milk twice a day for 4 consecutive days. To prevent the anticipated decomposition of ammonium sulphate in the forestomachs, 2 ml. of lactic acid were added to the milk and to guarantee its direct passage through the abomasum it was administered from a tight-necked bottle (Lavrova, 1956).

Sulphaguanidine was given at doses of 200 mg. per kg. of bodyweight on the first day and 150 mg. per kg. on the 3 following days; sulphamethazine was administered at doses of 160 mg. per kg. of bodyweight for 3 days and 80 mg. per kg. for 3 days more.

Framycetin was used at daily doses of 5 mg. per kg. of bodyweight for 3 days and tetracycline at daily doses of 12 mg. per kg. of bodyweight for 3 days.

Second outbreak (*Lesina valley*)

In a herd composed of 173 cattle, coccidiosis occurred in 22 subjects in the space of 31 days; 1 untreated animal died. In this outbreak 8 cattle were treated *per os* with a sulphonamide mixture (sulphadiazine, sulphamerazine, sulphamethazine and sulphathiazole *ana* 25) in doses of 150 mg. per kg. of bodyweight on the first day and 100 mg. per kg. on the following 3 days; 4 cattle were treated with ammonium sulphate, 5 with sulphaguanidine and 4 with sulphamethazine using the same doses and route as in the first outbreak.

Results

Of 12 cattle treated with ammonium sulphate, 9 recovered in the space of from 3 to 5 days without having recourse to other specific or supporting therapy. One calf already in the advanced phase of the illness, died in extreme cachexia 10 days after the beginning of the therapy with ammonium sulphate. As a consequence of this, 2 other young subjects which had not benefited from the ammonium sulphate after 5 days, and still showed haemorrhagic diarrhoea and aggravation of the already poor general condition, were treated with sulphamethazine at the doses mentioned above. This resulted in a quick recovery for both animals..

Sulphaguanidine, sulphamethazine and sulphonamide mixture, by which 10, 7 and 8 cattle respectively were treated, caused the rapid and complete recovery of the subjects. Framycetin and tetracycline, by which 4 and 5 cattle, respectively, were cured, produced the disappearance of oöcysts and blood from faeces in all the animals, but did not suppress diarrhoea in 2 subjects of the group dosed with framycetin and in 3 cattle of the group dosed with tetracycline. Even in these subjects with persistent diarrhoea, the administration of sulphonamides produced good results (see Table I).

Morever, 2 cattle—of which one belonged to the first herd and the other to the second—not having been treated, died. The macroscopic examination of their viscera showed lesions on the mucosa of ileum, caecum and rectum. The mucous membrane appeared reddish-grey with numerous haemorrhagic areas. The histological examination showed the presence of chronic enteritis, colitis and proctitis in various stages of evolution.

During the therapeutic trials in the second locality we thought, because of the spread of the affection, of administering the ammonium sulphate for prophylactic use according to Petrov's prescriptions. Those animals which appeared healthy were therefore divided into 2 groups; the former was treated with ammonium sulphate (3 g. *per os*), whereas the latter was left as a control. In neither of the 2 groups were clinical cases of coccidiosis noticed.

Discussion

Though in the therapy of bovine coccidiosis the parenteral route has been employed with advantage, in our trials the various drugs were administered only by the oral route as, on account of the difficulty of access to alpine zones, the treatment can only be made exclusively by the herdsmen.

TABLE I

Treatment	Animals	Cured	Dead	Animals not cured and treated later with sulphamethazine		
					Cured	Dead
	No.	No.	No.	No.	No.	No.
Ammonium sulphate	12	9	1	2	2	–
Sulphaguanidine	10	10	–	–	–	–
Sulphamethazine	7	7	–	–	–	–
Sulphonamide mixture	8	8	–	–	–	–
Framycetin	4	2	–	2	2	–
Tetracycline	5	2	–	3	3	–
	46	38	1	7	7	–
Controls	2	–	2			

The condition of the animals treated with the various drugs, generally, improved quickly with a return of appetite, rumination, and vivacity and with a gradual disappearance of diarrhoea, whereas the intense thirst, caused by the dehydration, persisted for some days. In nearly all cases the sulphonamides brought about the best results, independently of the condition of the subjects treated. On the whole, the ammonium sulphate produced positive results if administered at the beginning of the disease and to animals in good condition; in fact, diarrhoea in 2 unthrifty calves was arrested only by successive administration of sulphamethazine and in a third subject, in an advanced state of illness, the ammonium therapy had no effect at all. These results, however, do not diminish the value of ammonium sulphate; the drug has good therapeutic activity and, above all, is cheap.

We cannot form a judgment of the prophylactic value of ammonium sulphate, because in neither of the two groups of cattle treated did clinical cases of coccidiosis occur.

Framycetin and tetracycline, though curing 4 cattle, gave unsatisfactory results in 5 others. One can therefore affirm that neither of the antibiotics represent the drug of choice in the therapy of bovine coccidiosis. The negative results obtained with tetracycline by the oral route agree with Barrows', who with oxytetracycline *per os*, in contrast to the results obtained by parenteral route, did not report good results in coccidiosis of older cattle.

On the basis of the results obtained one can affirm, in accordance with Fritzsche *et al.* (1951), that the therapy of bovine coccidiosis depends not so much on the number of oöcysts in the faeces, but on the constitution and resistance of the animals. While sulphonamides are therefore advisable for unthrifty cattle, the use of ammonium sulphate is indicated for subjects in better condition.

References

ARTHUR, G. H. (1944). *Vet. Rec.* **56.** 250.
BARROWS, E. D. (1957). *Vet. Med.* **52.** 164–6.
BENBROOK, E. A., & SLOSS, M. W. (1955). "Veterinary Clinical Parasitology" 2nd ed., p. 4–5. The Iowa State College Press, Ames.
BOUGHTON, D. C. (1943). *Amer. J. vet. Res.* **4.** 66–72.
———, & DAVIS, L. R. (1943). *Ibid.* **4.** 150–4.
DAVIS, L. R., & BOWMAN, G. W. (1951). *Proc. U.S. Livestock Sanitary Assoc.* **55.** 39–50.
———, & ———. (1954). *Cornell Vet.* **44.** 71–9.
DUNLAP, R. E. (1949). *Sthwest. Vet.* **2.** 44–5.
FOSTER, A. O. (1953). *Proc. XV Internat. Vet. Cong.* **1.** 458–68.
FOX, F. H., & ROBERTS, S. J. (1949). *Cornell Vet.* **39.** 249–60.
FRANK, E. R. (1949). *N. Amer. Vet.* **30.** 238–39.
FRITZSCHE, K., & BERG, W. (1951). *Tierärztl. Umsch.* **6.** 305–8.
HORTON-SMITH, C., TAYLOR, E. L., & TURTLE, E. E. (1940). *Vet. Rec.* **48.** 829–31.
LAVROVA, V. V. (1956). *Veterinariya, Moscow.* **33.** 46–9.
LEI, G. M. (1955). *Vet. ital.* **6.** 278–3.
LUCAS, A., TOUCAS, L., & LAROCHE, M. (1956). *Rec. Méd. vét.* **132.** 925–8.
MAGLIONE, E., & VACIRCA, G. (1954). *Veterinaria, Milan.* **3.** 3–5.
MCPEEK, R., & ARMSTRONG, F. E. (1941). *Vet. Med.* **36.** 199–201.
METELKIN, A. I. (1941). Cited by Petrov, V.A.
MORTELMANS, J., & VERCRUYSSE, J. (1953). *Vlaam. diergeneesk. Tijdschr.* **22.** 297–305 (*Vet. Bull.* (1954). **24.** 299).
NEAL, F. C. (1956). *Sthwest. Vet.* **9.** 215–7.
PENNINGS, A. W. (1952). *Ibid.* **5.** 350–2.
PETROV, V. A. (1956). *Veterinariya, Moscow.* **33.** 30–2.
SIMMS, B. T. (1948). Annual report chief U.S. Department of Agriculture Bureau of animal industry, p. 61.
———. (1949). *Ibid.*, p. 51–2.
———. (1950). *Ibid.* p. 53–4.
STEWARD, J. S. (1947). *Vet. Rec.* **59.** 21–7.
STOWE, C. M., PALLESEN, D., & HARTMAN, W. (1957). *Amer. J. vet. Res.* **18.** 511–8.

CAMBRIDGE SCHOOL OF VETERINARY MEDICINE "OPEN DAYS"

The School of Veterinary Medicine is holding "Open Days" on Thursday and Friday, October 2nd and 3rd, 1958, between 2 and 5 p.m. each day, the first day being intended mainly for members of the University and the second for senior forms of Schools in and around Cambridge, and for members of various institutions which have expressed a desire to visit the School. Demonstrations are being arranged to illustrate various aspects of the School's work.

Although the occasion and the demonstrations are not primarily intended for veterinarians, who generally have other opportunities to visit the School, any veterinarians who may wish to come on the first day, that is Thursday, October 2nd, between 2 and 5 p.m., will be very welcome.

The Organisation Behind a Veterinary Chemical

BY

J. R. GWILT

Bayer Products Ltd., Newcastle upon Tyne

CONTRARY to popular opinion, veterinary chemicals production is not just an off-shoot of pharmaceuticals manufacture but is a virile industry in its own right. Many techniques of manufacture are, of course, common to both interests and consequently—if only for reasons of streamlined production and of economy—the two are frequently found in close association. Despite the rapid increase in mechanisation of all aspects of life in recent years, veterinary practice continues to grow and the need for specialised animal preparations has been increasingly recognised. There was, therefore, ample justification for the publication some five years ago of the "British Veterinary Codex" (1953). Like its pharmaceutical counterpart, it contains not only the time-tested remedies but also modern specialities, and it is perhaps a truism to emphasise that the proprietary preparation of to-day may well be the subject of an official monograph in a future Codex.

The Search for New Veterinary Chemicals

Research to-day must commence in the library. It was estimated 8 years ago that about a million scientific papers were then being published annually (Larkey, 1950). Consequently it is a major problem to keep abreast of the flood of research communications and patents in even a small specialised section of the world's scientific literature. Access to adequate library facilities is, therefore, an essential and integral part of research.

Whether the line of research is aimed at a specific need or not, it almost always now proceeds *via* the chemical laboratory. The discovery or recognition of a pharmacologically desirable trait in a chemical compound leads to the preparation of all possible homologues and chemical variants in an effort to increase therapeutic value and concurrently minimise objectionable side-effects or secondary action. Where no such starting-point is available, the alternative research procedure is to prepare new compounds for screening in the hope that desirable characteristics may be found.

In either event, the next stage is the pharmacological examination of the compounds concerned. *In vitro* tests may give a useful indication, as in determining the spectrum of a new antibiotic, but there must always be *in vivo* tests at some point. A major problem to-day is to hold the balance between economy in facilities and effort on one hand, and the desirability of complete screening on the other. As in all research, the formula for success is a little inspiration, much effort, and some luck. Too often, compounds with very desirable pharmacological properties have been missed initially because screening was not thorough enough.

As soon as it seems that a new drug of potential value has been discovered, pharmacological studies are intensified. Variation in effect on different animals is assessed; acute and chronic studies are made, and organs of sacrificed animals examined in great detail for possible morphological changes. These various studies are generally made on selected strains of mice and other rodents, as experience has shown that results may often be extrapolated to values for larger animals with considerable success. With this information available, field (clinical) trials can be commenced, and these must be controlled as closely as possible. The placebo has rather less value than in human medicine as subjective evaluation is rare. There is, however, no doubt that in certain instances double blind techniques are essential to eliminate possible bias where reporting of results must be based on observation and estimation rather than on direct measurement: chemical, bacteriological, or otherwise.

This is the point where consideration may well be given—in appropriate cases—to the possible use of the new drug in human medicine also, and it is in this way that the fields of pharmaceuticals and of veterinary medicinals first show their inter-relation.

Development into a Commercial Product

During the pharmacological evaluation of a new compound, information is gathered regarding the desirable dosage rate and the necessary route of administration—whether it can be given orally or must be injected, whether an injection should be intramuscular or intravenous, and so on. A detailed laboratory examination of the chemical and physical properties of the pure substance yields further pertinent information—whether it must be protected from oxidation, how it can be prepared in a sterile form for injection, etc.

With the data now available, three development functions commence co-ordinated studies—on product (compounding) development, package development, and process development. These sections are mutually interdependent at various points. The aim of product development is to compound the preparation into a form which ensures maximum performance, acceptance, and shelf life within the limitations imposed by economics and by the other development functions. Package development not only specifies the method of packaging necessary to safeguard formulations developed but also feeds back suggested improvements or economies. Thus inclusion of a therapeutically inactive corrosion inhibitor may enable the safe distribution of a paste in unprotected aluminium collapsible tubes, whereas the original formula may have required internal lacquering or waxing of the tubes. Similarly, process development may suggest a minor change in lubricant or excipient to avoid double slugging in tablet manufacture.

The many problems that invariably arise are resolved only by complete integration of the develop-

ment functions into one group, capable of assessing correctly the relative values of the arguments involved and arriving rapidly at a form of compromise which will make the proposed product safely available commercially at the earliest possible time with the balance adequately held between perfection and practicability.

Immediately a formulation shows promise, it is placed on stability test in each of the various possible package forms. To predict probable performance, accelerated ageing tests are also carried out, samples being stored either at a series of fixed temperatures from 0° to 50° C., or in a special cabinet in which the conditions of temperature and humidity pass through a regular set cycle. In general, a rise in storage temperature of 10° C. within the above range approximately halves the safe life of most products, but this generalisation must be interpreted with caution as very occasionally—*e.g.* in sodium stearate based emulsions—stability is enhanced at the higher temperature.

Where appropriate, accelerated light exposure tests are also made, using an ultra-violet source.

Should the Product be Marketed ?

The frequency of introduction of therapeutically new products is to some extent a measure of the research virility of an organisation. A new compound will only have reached commercial consideration if the promise of the therapeutic value originally found during screening has been borne out by subsequent and adequate field trials. At this point, one or more forms of the proposed product are available from the development group, together with recommendations on packaging and a report on probable production techniques. The development recommendations must obviously be supported by analytical data on stability tests carried out under normal and rigorous conditions.

Cost estimates can now be prepared. At the same time, market survey results are required, particularly on the following questions:—

1. Is the therapeutic advantage of this new product sufficiently dramatic, or unique, to warrant its being marketed without further consideration?
2. If successful preparations are already commercially available for the same therapeutic indications, does the one now under consideration show significant advantages in respect of, *e.g.*, reduced side-effects, greater convenience or acceptance, greater economy or stability, etc.?
3. Is the market big enough to warrant production for sale at an economic price? Alternatively, is there a moral obligation to market such a product?

It is with these and similar considerations in mind that the final decision is taken to put the new chemical into production.

Going into Production

In the full-scale manufacture of a new chemical, studies in the research laboratories, together with literature surveys and previous experience, indicate the most suitable route from raw materials available locally. As the batch size is scaled up, so production moves from the laboratory into the pilot plant and then into bulk manufacture. At each change, problems arise, such as adequacy of reaction time, and are resolved by the research and process control laboratories. Specifications for raw materials, intermediates, and the final pure substance are developed by the analytical laboratories, bearing in mind likely contaminants and their effect on stability and efficacy.

Compounding on the large scale presents problems differing markedly with the form of presentation. Powders should preferably contain ingredients of similar particle size and density to facilitate mixing and minimise separation in distribution. Tablets have largely superseded powders, particularly for convenience of dosage, but despite the control of materials for such features as particle size, moisture, etc., tablet making remains largely an art. Because of the problems involved, periodic checks are made on each tableting machine for such characteristics of the tablets as: correct average weight, low variation in weight from average, thickness, hardness, disintegration time, and fragility. Some of these factors are interrelated but all are important.

Injections require the most stringent production discipline. Bacteriological checks are made regularly on the cleanliness of the Sterile Department and of the incoming air. Problems also arise on the suitability of glass, rubber closures, and other materials in contact with the parenteral solution, particularly during sterilisation and in the finished pack, while sterility and freedom from pyrogens or undue toxicity are largely controlled by use of correct production techniques.

The Control of Quality

No system—however thorough—of inspection or testing will *put* quality into any product. Quality must be planned at the development stage, founded upon correct specification of raw materials and processing, and built-in by the skill of the production personnel. The hardest aspect of quality control lies in inculcating quality-consciousness at operative level, particularly on products in constant production. The achievement of this is, however, the greatest single factor in building and maintaining a manufacturer's reputation.

Certain standards are laid down officially, *e.g.* in the " British Veterinary Codex." Such standards are, however, minima, and the reputable manufacturer sets his own internal standards considerably higher for two major reasons. Firstly, quality control can be based only on random sampling, and the higher standards allow a margin for possible sampling errors which may arise purely on statistical grounds; this margin ensures that all samples will amply meet official criteria. Secondly (and this applies particularly to branded products in competitive fields), a manufacturer wishes to build and maintain a reputation for high standards. In the parallel field of pharmaceuticals, reports published during the last 2 years have shown that proprietary preparations often are of significantly higher quality than their unbranded official equivalents (Bagnall *et al.*, 1956; Anon, 1957; McClure Brown *et al.*, 1957).

(*Continued at foot of col.* 1, *p.* 793)

XUM

The New President of the British Veterinary Association

AT the Annual General Meeting of the Association held in Douglas, Isle of Man, last Monday, Mr. H. F. Hebeler was unanimously and with acclamation elected President for the year 1958-59. Mr. Hebeler is not new to office, and it will be recalled that he served a distinguished term as Honorary Secretary from 1950 to 1953. The duties which fall to the lot of the Honorary Secretary are an admirable preparation for the presidency, and in Mr. Hebeler the Association has elected a veterinary surgeon of proven capacity and of wide experience in its affairs.

The new President is a comparatively young man, having been born in 1917, and that must be reckoned an advantage at a time when veterinary science is progressing so rapidly, when the Association is growing, and when the presidency becomes constantly more exacting and calls not only for intellectual vigour but for personal energy of a high order.

Though born in Edinburgh, he is only Scottish through his mother's family. He was educated at the Edinburgh Academy, at St. Edward's School, Oxford, and then privately. It was during this period of private tutorship with a "sporting" clergyman that Mr. Hebeler developed a love of the countryside, and an interest in animal life, which finally decided him to study veterinary surgery. After a year spent in farming he joined the Royal (Dick) Veterinary College, qualifying in 1940.

At this time veterinary practice was beginning to recover from the first shock of war and Mr. Hebeler became an assistant in the partnership of Mr. D. S. S. Nicholson and Mr. C. S. (now Professor) Grunsell, being appointed to manage a branch of their practice at Langport in Somerset. After some strenuous years this part of the practice began to struggle to its feet, and Mr. Hebeler arranged to purchase it from the partners. He has remained a principal at Langport ever since.

He married, in 1943, Daphne Watson, who died three years later from an illness developed as a result of service with the Armed Forces. Mr. Hebeler has one son of this marriage and two of his subsequent marriage to Sybil Palmer which took place in 1947. Mrs. Hebeler is a familiar and popular figure at Annual Congresses and has many friends among the members of the Association and their wives. One of her hobbies is riding, and she is an accomplished horsewoman.

It is a happy coincidence that Mr. Hebeler, with his enviable reputation throughout the West Country as a clinician, follows as President another brilliantly successful practitioner in the person of Mr. J. M. Ingram. A substantial proportion of the membership of our Association consists of veterinary surgeons in private practice and they could hardly have elected to the highest office two men more fully conversant with every practical aspect of the profession. It may be remarked, also, that both are shining examples of the capacity to keep fully up to date if the will to do so is there. The plea that the busy veterinarian is too much occupied to keep up with the literature is one which has tended to gain over much currency in these days; but the new President, like his predecessor, makes time to be well informed —a factor which no doubt has contributed substantially to the clinical prestige he now enjoys. He is not only a reader of the literature, but a contributor to it, as evidenced by a number of notable clinical communications published in THE RECORD.

He is a fairly frequent, and always welcome speaker at Young Farmers' clubs and other agricultural meetings, and is of opinion that the discussion of practical problems in such surroundings does nothing but good to the profession. He is enthusiastic, too, for the spread of knowledge through our literature, and is a keen supporter of THE VETERINARY RECORD and other publications issued by the B.V.A.

During his period of office as Honorary Secretary, and as Chairman of the Organising Committee (1950-57) his name came to be associated with negotiations between the B.V.A. and the animal welfare societies. His policy was always to welcome the work of the societies within its legitimate sphere, and to try to bring about conditions when the profession could co-operate in the societies' undertakings with proper regard to ethical and other considerations. It may be observed that, had certain of the societies shown a spirit of co-operation comparable to that which he extended to them many of the difficulties which have arisen over the years, and which remain in existence, might have been overcome.

Mr. Hebeler has been a prominent member of the Western Counties Veterinary Association for the past 17 years. That Association elected him to serve on the Council of the B.V.A. in 1947, and made him its own President in 1955. He is the first B.V.A. President from the Western Counties for many years; the last having been the late Mr. H. Bloye in 1898-99.

His colleagues, not only in the West of England but throughout the United Kingdom, will wish Mr. Hebeler every success in his presidential year. They may be sure that the presidency of their Association has been entrusted to a veterinary surgeon whose vigorous mind, personal energy, and high professional ability fit him most fully for the heavy task he has taken up. Everyone who knows him personally admires the integrity of the conscientiousness with which Mr. Hebeler carries out every task entrusted to him, of which the present is the heaviest and most responsible. It is such qualities, together with his natural acumen—to say nothing of a ready and copious sense of humour—which bid fair to make his presidential year a notable one.

Mr. H. F. HEBELER, M.R.C.V.S., the new President of the British Veterinary Association.

XUM

JUNIOR VICE-PRESIDENT OF THE B.V.A.

Mr. S. L. Hignett was unanimously elected Junior vice-President and President-elect at last Monday's Annual General Meeting. The large audience present made abundantly clear their warm approval of this choice which falls, indeed, upon a member of the profession of outstanding popularity.

Mr. Hignett was educated at the Priory County School, Shrewsbury, and the Royal Veterinary and Birkbeck Colleges, London. For 3 years he was demonstrator in anatomy at the Royal Veterinary College and towards the end of that period lectured in surgery. Early in 1937 he was appointed to work under Dr. A. W. Stableforth at the College in the division of preventive medicine. During this time he visited Copenhagen and Hanover to work on problems of reproduction in cattle under the late Professors Folmer Nielsen and Götze respectively. Towards the end of 1939 he was appointed to the staff of the Department of Agriculture, University of Leeds, as veterinary investigation officer for Yorkshire where he continued to take a special interest in diseases of the udder and in reproductive disorders in cattle. He was awarded the Victory Medal by the Central Veterinary Society in 1941.

In 1943 he moved south again to join the staff of the Wellcome Foundation under Dr. R. F. Montgomerie and to take charge of the Wellcome Veterinary Research Station which was shortly to be established at Frant in Sussex. Here, under his leadership, a very active team of research workers have studied many aspects of animal disease.

He has been a member of the Council of the Association for a number of years, has served on several standing Committees, and is at present chairman of the Technical Development Committee. He has been President of three Divisions: the Sussex Veterinary Society, the South Eastern Veterinary Association and the Society for the Study of Animal Breeding. In 1951 he was local secretary for the Eastbourne Congress.

The Organisation Behind a Veterinary Chemical—*Cont.*

The tests applied to a veterinary preparation will, of course, depend largely on the mode of presentation. The assessment of positive quality includes assay for the presence of the correct active ingredients in the declared or specified concentrations, stabilisation of the *p*H of an injection at the correct value, adequate speed of disintegration of tablets, correct softening point of pessaries, and so on. Over and beyond these features, much control work is aimed at ensuring the absence of undesirable features. Thus injections must be sterile and pyrogen-free; they must meet toxicity requirements; heavy metals and other harmful contaminants are permitted in only minute specified amounts, well below harmful concentrations.

Quality control is also concerned with the adequacy of packing and the maintenance of packaging standards. A well-presented pack with clear print and a clean correctly-applied label inspires confidence in the user as it is symptomatic of care and thought in development and production. Furthermore, quality control does not cease as soon as the pack is completed. Adequate file samples are retained, not only for reference in the rare event of a complaint, but also for periodic review to ensure that the product is stable during its expected shelf-life.

Control is a major feature and a significant part of the cost of a veterinary chemical. However, it is a false economy to evade adequate testing. George Miller of Strong Cobb & Co., Inc., once summed up the attitude of enlightened management thus:—

> "Control is red tape, but red tape is insurance, it is safety. The red tape pays off in black figures for the customer." (Miller, 1950).

Conclusion

It is evident, therefore, that a vast amount of effort is put into any new veterinary chemical. There are occasional short-cuts, *e.g.* where 2 existing drugs of proven stability and efficacy, can be combined into a compound preparation. However, the development, *ab initio*, of a new weapon against animal disease requires months or even years of study and testing before it can confidently be marketed—and these difficulties are increased where the application is seasonal only.

In spite of—or because of—this, research and development must be conducted as a matter of urgency. Only really adequate sales of established lines can afford a large research volume and in turn, only adequate research can ensure the continued advance in veterinary medicine which is an obligation, both economic and moral, upon mankind.

> "To all, life Thou givest—to both great and small;
> In all life Thou livest, the true life of all."
>
> W. C. Smith.

References

ANON (1957). *Pharm. J.* March 16th. 441.

BAGNALL, H. H., & STOCK, F. G. (1956). *Ibid.* December 8th. 441.

———, & ———, (1957). *Ibid.* March 9th. 173.

British Veterinary Codex, 1953. Pharmaceutical Press, London.

LARKEY, S. V. (1950). *Bull. med. Library Assocn.* **38.** 291.

MCCLURE BROWN, J. C., *et al.* (1957). *Brit. Med. J.* February 23rd. 436.

MILLER, G. (1950). *Drug & Cosmetic Ind.* **67.** (3). 310.

MINISTRY OF AGRICULTURE POST-GRADUATE SCHOLARSHIP AWARDS

The Ministry of Agriculture has awarded 43 post-graduate scholarships in agricultural science, agricultural economics, farm management and husbandry. These are tenable in the first instance at the various universities or institutes shown on the official list for periods of up to two years, normally from October 1st, 1958.

The Ministry also announces that the maintenance allowances paid to its post-graduate scholars are being increased with effect from October 1st, and will be as follows:—

Students living away from their parents' homes:—

	£
Oxford and Cambridge ...	420
London	400
Other Universities	340

Students living at their parents' homes:—

London	285
Elsewhere	270

News and Comment

The Official Opening of Congress

The Association's 76th Annual Congress was opened officially by the Deputy Governor of the Isle of Man, His Honour Deemster S. J. Kneale, O.B.E., at the Palace Theatre, Douglas, last Monday, after an address of welcome by the Mayor, Councillor J. R. Killip, J.P. The President of the B.V.A. presided.

In the course of his address the Mayor said:—

"We very much appreciate the compliment you have paid us in selecting Douglas as the venue for your Congress. This is the first time that Douglas has been so honoured by your Association, but I should like to think that after you have been in our midst a little while, and have seen the facilities which we are able to offer to conferences, and have partaken of our hospitality for which we Manx people are renowned, you will decide to come again in the not too far distant future."

The Mayor assured delegates that they would find Douglas and the Island a friendly place, and that the town council, together with the Manx people generally, would do everything they could to make their stay a pleasant one. "I ask you, therefore,

Dr. W. R. Wooldridge, winner of the Dalrymple-Champneys Cup and Medal, with Mr. Callender, the senior vice-President.

The President arrived for the opening ceremony in appropriate style, driving one of the unique Isle of Man horse trams. Mr. Ingram proved himself an able whip, and controlled the equipage with nonchalance.

to make yourselves at home for as long as you choose to remain in our country, and I trust that this Congress will be such a successful one in every respect that it will be memorable as one of the best you ever held," he concluded.

The President then introduced the Deputy Governor who said he had the very pleasant duty of extending to members, their ladies and their guests a very warm welcome to the Isle of Man. That task had been simplified to a great extent by the excellent brochure which had been issued, containing words of welcome from the Lieutenant Governor. Many present would be visiting the Isle of Man for the first time, and it was to be hoped that they would seize every opportunity, consistent with their duty, to visit the various parts of the Island and become acquainted with the people.

The Congress programme appeared to be most comprehensive, and he was delighted to observe that every possible facility was being given by the Isle of Man Board of Agriculture and Fisheries to acquaint members with farming conditions and the animal health of the Island.

The Deputy Governor then described the effects of the Improvement of Livestock Act, 1949. It was under the Act, he said, that the completion of the T.T. Attested Herds Scheme had been achieved.

An important factor had been the financial assistance which the farmers received from the Isle of Man Government. Remembering that roughly £1,000 of Isle of Man Government expenditure was equivalent to £1,000,000 expended in England, it was

Mr. Henry Sumner, President of the Lancashire Division, who are hosts to Congress, receives the President and Mrs. Ingram at the inaugural At Home.

The opening ceremony. Left to right, the Town Clerk, the Mayor, Councillor John R. Killip, J.P., the President, the Deputy Governor, His Honour Deemster Sydney J. Kneale, O.B.E., Mrs. Ingram, Dr. Cotchin, Mr. Henry Sumner, and Dr. J. K. Walley, joint hon. secretary to the Congress.

of interest to note that the Government of the Isle of Man to date had expended £486,500 in compensation for compulsory slaughtered animals.

Most of the farms on the Island were now benefiting from public electricity supplies and public main water supplies, largely due to generous Government grants in aid. "We think we have succeeded in stopping the drift from the rural areas to the town areas," he added.

In conclusion the Deputy Governor emphasized the welcome extended to members and guests, and assured them that everything possible would be done to make their visit instructive, helpful and interesting.

The President said that those present very much appreciated the cordial terms of the welcome which had been extended by the Isle of Man and its principal city, Douglas, and all that was offered in the beauty of the scenery, the comfort of the amenities, and the warmth of the hospitality. The 1958 Congress was fortunate in the number of official guests present, and the President extended a warm welcome to all of them, particularly to visitors from overseas. He thanked the Deputy Governor for having spared the time to attend the formal ceremony, and for having declared open the 76th Annual Congress. All concerned looked forward to a fruitful and profitable week.

The Church Service

The President, Officers and their ladies, together with a large number of delegates, attended evensong last Sunday at the parish church of St. Thomas, Douglas. The vicar, the Rev. G. Parr, M.C., B.A., conducted the service, during which prayer was offered for the success of the Congress, and a formal welcome to the profession expressed. It was generally felt that official attendance at Divine Service—which was also done at Leamington two years ago—might well establish a tradition as the first event of future Congress weeks.

The Lancashire "At Home"

The traditional "At Home" given by the host Division to welcome delegates to the annual Congress was held in the Villa Marina on Sunday night. A very happy occasion was presided over by Mr. Henry Sumner, the epitome of Lancashire hospitality, and under his genial guiding hand Congress got off to a first-rate start. After supper a film show had been arranged in aid of the funds of the Victoria Veterinary Benevolent Fund and the National Veterinary Benevolent Fund. The sum of £29 was raised.

The Trade Exhibition

The President opened the Trade Exhibition immediately after the formal opening ceremony of Congress. He referred to the value of the veterinary research carried out by a number of leading commercial companies, which had added appreciably to our knowledge and so benefited the veterinarian in the field. Some of the work which had been accomplished had been published from time to time in THE VETERINARY RECORD. The exhibition, the President went on, was a most interesting and valuable adjunct to each annual Congress; it was admirably presented and always enjoyed.

On behalf of the exhibitors, Mr. H. C. H. Gray thanked the President and presented to him and Mrs. Ingram a mirror as a memento of their Congress.

The Mayoral Reception

The Mayor and Mayoress of Douglas, Councillor and Mrs. J. R. Killip, received the delegates at the Villa Marina on Monday evening. There were also present the Deputy Governor of the Isle of Man, the Town Clerk, and other dignitaries of the city and the Island. After the reception dancing to an excellent band was enjoyed for the remainder of the evening. Delegates were much indebted to the Mayor and the civic authorities for a most hospitable and happy time, which fittingly concluded a successful opening day.

MR. J. C. NAYLOR

It was with deep regret that delegates learned of the death of Mr. J. C. Naylor, a well-known Isle of Man veterinary surgeon, which took place on Saturday last, the eve of Congress. The funeral service at Rosemount Church, of which Mr. Naylor was a trustee, was held on Tuesday. Many friends were present including his brother, Professor Naylor of Belfast; Mr. E. R. Callender represented the B.V.A., and among local veterinary surgeons present at the service was Mr. D. W. Kerruish, Mr. R. H. Hamblin, Mr. D. R. V. Crichton, Mr. G. S. Cowin, and Mr. G. B. Stubbs.

R.C.V.S. OBITUARY

We record with regret the death of the following member of the profession:—

HODDINOTT, Donald Richard Faulkner, The Grange, Lapford, Devon. Graduated Liverpool, July 21st, 1911. Died September 17th, 1958, aged 70 years.

UNIVERSITY NEWS

Liverpool

Examination List for Degree of B.V.Sc.

Final Examination, September, 1958

Barr, D. A.; Death, R. W. J.; Ducker, M. C.; Haywood, R. H.; McFarland, A. G.; Penhale, W. J.; Robson, J.

First Examination, September, 1958

PART I.—CHEMISTRY

Curran, M. K.; Hallows, B. J.; Hammonds, Patricia; Thompson, Hannah S.

PART II.—PHYSICS

Strong, M. G.

PART III.—BOTANY

Sopronfalvy, M.

PART IV.—ZOOLOGY

Pierrepoint, C. G.

PERSONAL

Major R. C. G. Hancock, B.SC., M.R.C.V.S., who retired in June from the post of Chief Veterinary Officer to the R.S.P.C.A., has been appointed to the

staff of Aspro-Nicholas Limited. Major Hancock will be mainly engaged in organising and following up field trials of the Cobalt Bullet now in progress in Great Britain and overseas and expects to hand over to his permanent successor in the course of the next few months.

Birth

KEEP.—On September 12th, 1958, in Johannesburg, S. Africa, to Pearl Jane (*née* Levens-Ing) and Michael Eric Keep, M.S.R.C.V.S., a son (Johnathan Peter), brother for Christopher Michael.

Marriage

HARRISON—ORBELL.—On September 20th, 1958, at St. Nicholas Church, Denston, Newmarket, Keith Stanley Harrison, M.R.C.V.S., of Haverhill, to Eleanor Josephine Orbell of Denston.

COMING EVENTS

September

30th (Tues.). Meeting of the B.S.A.V.A. (Midland Region) at the Swan Hotel, Stafford, 7.30 p.m.

October

1st (Wed.). Meeting of the Welsh Branch in the Cambrian Hall, Swyddfa'r Sir (County Offices), 2.15 p.m.

2nd (Thurs.). General Meeting of the Central Veterinary Society at the Royal Veterinary College, Camden Town, N.W.1, 6 p.m.

3rd (Fri.). Meeting of the Shropshire Veterinary Club at the Oak Hotel, Shelton, Shrewsbury, 8 p.m.

4th (Sat.). R.A.V.C. Old Comrades' Association Annual Reunion and Dinner, Bridge House Hotel, London Bridge.

8th (Wed.). General Meeting of the Lancashire Veterinary Association in the Veterinary Hospital, University of Liverpool, 2.30 p.m.

9th (Thurs.). Meeting of the Ayrshire Veterinary Association in the Ailsa Lounge, 2.30 p.m.

Meeting of the Lakeland Veterinary Association at the George Hotel, Penrith, 6 p.m.

10th (Fri.). General Meeting of the Midland Counties Veterinary Association at the Ministry of Agriculture Veterinary Investigation Centre, Block C, Government Buildings, Redhill, Worcester, 2.45 p.m.

General Meeting of the North of Ireland Veterinary Association at the Veterinary Research Division, The Farm, Stormont, 2.45 p.m.

14th (Tues.). Dinner-Dance of the Mid-West Veterinary Association at The Berkeley Café, Clifton.

15th (Wed.). Meeting of the Southern Counties Veterinary Society at the Royal Hotel, Winchester, 7.30 p.m.

General Meeting of the South Eastern Veterinary Association at the Royal Star Hotel, Maidstone, 2.30 p.m.

16th (Thurs.). General Meeting of the Herts and Beds Veterinary Society at the Peahen Hotel, 14, London Road, St. Albans, 7.30 p.m.

17th (Fri.). Meeting of the Lincolnshire and District Division at the George Hotel, Grantham, 2.15 p.m.

General Meeting of the Mid-West Veterinary Society at the Berkeley Café, Clifton, Bristol, 2.15 p.m.

General Meeting of the Lincolnshire and District Division at the George Hotel, Grantham, 2.15 p.m.

22nd (Wed.). Meeting of the R.A.V.C. Division at the Home of Rest for Horses, Boreham Wood, Herts., 11 a.m.

23rd (Thurs.). Dinner-Dance of the Yorkshire Veterinary Society at the Cairn Hydro Hotel, Harrogate.

24th (Fri.). Annual Dinner-Dance of the South Wales Division at the Seabank Hotel, Porthcawl, 8.30 p.m.

31st (Fri.). General Meeting of the Yorkshire Veterinary Society at the Hotel Metropole, Leeds.

ADDRESSES OF DISEASE INFECTED PREMISES

The list given below indicates, first the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax

Cambs. Coombe Grove Farm, Arrington, Royston (Sept. 22).

Ches. Back Lane Farm, Brereton, Sandbach (Sept. 15).

Norfolk. The Woodyard, Mill Lane, Horsford, Norwich (Sept. 18).

Oxford. Middle Farm, Assendoh (Sept. 22).

Somerset. Batch Farm, Lympsham, Weston-super-Mare (Sept. 19).

Fowl Pest

Essex. 2, Ludham Hall Lane, Braintree (Sept. 16); St. Mary's Station Road, Thorrington, Colchester (Sept. 20).

Norfolk. Laurel Meadow Orchard, The Street, Bunwell, Norwich; Low Road, Thurlton, Haddiscoe (Sept. 12); Fengate, Marsham; The Laurels, Forncett St. Peter, Norwich (Sept. 13); Green Farm, Stalham, Norwich (Sept. 18); Wellholme, The Green, Stalham; Fengate Farm, Marsham; The Green, Stalham, Norwich (Sept. 20).

Surrey. Selham Farmers, Horsham Road, Cranleigh (Sept. 16).

Sussex. Southease Farm, Southease, Lewes (Sept. 17).

Worcs. Parkmore Farm, Hartlebury, Kidderminster (Sept. 19); Ford Brook, Summerways Lane, Torton, Hartlebury, Kidderminster (Sept. 20).

Swine Fever

Beds. Top End Garage, Little Staughton (Sept. 15).

Bucks. The Allotments, Ditton Road, Datchet, Slough (Sept. 19).

Ches. Poplar Farm, Cuddington, Northwich (Sept. 19).

Devon. Chapelcroft Farm, Membury, Axminster (Sept. 19).

Dorset. Northbrook, York Road, Broadstone (Sept. 15).

Essex. Lower Farm, Mayland, Southminster (Sept. 15); Mole Hall, Widdington, Saffron Waldon (Sept. 16); Peynes Hall Farm, Debden, Saffron Walden (Sept. 22).

Hants. Butt Lane Piggeries, Throop, Bournemouth (Sept. 17).

Herts. The Piggeries, Old Brickfields, Oxhey Lane, Oxhey, Watford (Sept. 22).

Leics. Hall Farm, Broughton, Astley (Sept. 15).

Norfolk. The Bungalow, Green Lane, Rocklands, Attleborough (Sept. 15); Holt Road Farm, Wood Norton, Dereham; 77, Park Road, Spixworth, Norwich (Sept. 16); Sparham Piggeries, Gt. Witchingham, Norwich (Sept. 17); The Homestead, Banningham, Norwich; Shrublands, Norwich Road, Ditchingham, Bungay (Sept. 22).

Somerset. Week Farm, Combe Hay, Bath; Rubbery Farm, East Lydford, Yeovil (Sept. 15); Danscombe Piggeries, Lufton, Yeovil (Sept. 22).

Suffolk. Osborne's Meadow, Bruisyard, Saxmundham; Reydon Grove Farm, Reydon, Southwold (Sept. 12); Red House Farm, Worlingworth, Woodbridge (Sept. 22).

Warwicks. Burbury Estates, Woodhouse Farm, Bicknell Lane, Catherine De Barnes, Solihull (Sept. 12).

Worcs. Mooch Farm, Feckenham, Redditch (Sept. 15).

XUM

Letters to the Editor

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

Canine Insurance

Sir,—We, in this practice, were very interested to receive this week, from the Secretary of the B.S.A.V.A., details of a new scheme for canine insurance offered by Lloyd's Brokers (*Vet. Rec.* **70.** 766).

One section of this insurance scheme offers cover towards the cost of veterinary surgeons' fees. For several years we have considered introducing some similar idea for our own clients, but administrative difficulties have always proved too much. However, there is no doubt that such a scheme will be welcomed by the dog-owning public, for, using modern drugs, treatment can become expensive, and many owners find the payment of fees difficult.

An insurance scheme such as this will enable treatment to continue without quite so much thought to the ultimate bill that is to be presented to the owner; it should enable accounts to be paid more promptly, and will lessen the number of cases in which the final account has to be reduced drastically before being rendered.

I am sure that this insurance will prove of great interest to both dog owners and to veterinary surgeons engaged in canine practice, and will prove of benefit to both.

Yours faithfully,
F. G. STARTUP.

Grove Lodge,
Broadwater Street West,
Worthing,
Sussex.
September 19th, 1958.

Three Points in a Teaching Triangle

Sir,—In his lecture "Three Points in a Teaching Triangle," Professor Burrow has missed out one very important corner—the curriculum. Surely this triangle should be a quadrilateral! In any policy-making the first decision to make is whether the curriculum is to be fitted to the students or the students to the curriculum. Obviously with a much higher proportion of "earthy" and less academically able students standards must be lowered if the failure rate is not to be excessive since emphasis is upon academic achievement, *i.e.* the ability to pass scientific subjects at an adult level. If this policy were to be reversed certainly there might be adequate veterinary surgeons but would the prestige of the profession be enhanced in the field, to say nothing of the academic or scientific worlds?

This does not mean that the present methods of student selection are the best possible—in fact a wastage rate of 30 per cent. seems excessive, especially when another 20 to 30 per cent. do not pass unscathed. Teachers should follow the curriculum, and examiners should examine in accordance with it.

Yours faithfully,
C. M. GOULD,
A. C. GOULD.

10, Landguard Road,
Southampton.
September 22nd, 1958.

B.V.A. PUBLICATIONS

Readers may like to be reminded that a number of handbooks published by the Association are still available. Prices on request. The publications are as follows:—

"Husbandry and Diseases of Goats." 52 pp.

"Report of Grassland Conference, 1948." 114 pp.

"Report on Conference on the Feeding of Farm Animals for Health and Production, 1954." 204 pp.

"Report on Conference on Supplements and Additives in Animal Feeding-stuffs, 1956." 292 pp.

"Laboratory Aids to Clinical Diagnosis." 64 pp.

"Artificial Insemination of Cattle." 90 pp.

"Diseases of Sheep." 122 pp.

"Husbandry and Diseases of Pigs." 212 pp.

"Husbandry and Diseases of Calves." 92 pp.

A revised publication, "Parasitic Diseases of Cattle," will be completed later this year.

ADVERTISER'S ANNOUNCEMENT

THE ARMOUR LABORATORIES announce that W. Gimber & Sons, Ltd., are now distributing their Chorionic Gonadotrophin B.P. in ampoules of 1,500 I.U., together with ampoules of sterile diluent, in addition to their range of vitamin products.

DISEASES OF ANIMALS ACT, 1950—GREAT BRITAIN
Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period		Anthrax	Atrophic Rhinitis	Foot-and-Mouth	Fowl Pest	Sheep Scab	Swine Fever
16th to 31st August, 1958		2	1	1	51	—	33
Corresponding period in	1957	4	—	1	15	—	36
	1956	11	—	31	29	—	28
	1955	18	—	—	2	—	48
1st January to 31st August, 1958		106	4	114	477	—	898
Corresponding period in	1957	252	6	39	551	—	652
	1956	1,085	8	80	457	—	529
	1955	502	3	6	381	—	1,058